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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,234	05/31/2005	Hae Young Kim	LEE-0024	6371
23413	7590	06/09/2006		
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			EXAMINER BERNSHTEYN, MICHAEL	
			ART UNIT	PAPER NUMBER

1713

DATE MAILED: 06/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/537,234	<b>Applicant(s)</b> KIM ET AL.	
	<b>Examiner</b> Michael Bernshteyn	<b>Art Unit</b> 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>05/31/05</u> | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshino et al. (JP 05-074461) in view of Noritake et al. (JP10-302797).

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With regard to the limitation of instant claims 1-3, Yoshino discloses a secondary battery negative electrode using a carbonaceous material as negative electrode active material. In the negative electrode the negative electrode active material is bonded by a binder composed mainly of **styrene-butadiene** latex having a butadiene content of 40 to 95-wt% and a gel content of 75 to 100% (abstract).

Yoshino does not disclose that the polymer particles have structured form of two or more phases having different physical properties.

Noritake discloses that the electrode binder for batteries contains a copolymer produced by polymerization of monomer units. The electrode binder contains particles having core-shell structure of which the core is made of a (co)polymer having glass transition temperature in the range  $-100-0^{\circ}\text{C}$ , and of which the shell is made of a (co)polymer with glass transition temperature in the  $-5-50^{\circ}\text{C}$  (abstract)

Both references are analogous art because they are from the same field of endeavor concerning new polymer binders for lithium secondary battery.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate polymer core-shell structure of two phases having different physical properties as taught by Noritake in Yoshino's polymer binder composition in order to obtain an electrode binder for secondary batteries which provides high capacity, high charging performance, excellent charging and discharging cycle property and safety, and, for specifically, with which electrode activation material is retained on an electric collector material (JP'797, abstract), and thus to arrive at the subject matter of instant claim 1 and dependable claims 2-3. It is reasonable to expect

that in this case the cell property, adhesive strength and/or coating property have to be met.

With regard to the limitation of instant claims 4-11, Yoshino discloses that other than styrene/butadiene monomers can be used, for example ethylene nature unsaturated carboxylic acid, such an acrylic acid, methacrylic acid, itaconic acid, fumaric acid, and maleic acid; esters of unsaturated carboxylic acids, such as methyl methacrylate, ethyl methacrylate, butyl methacrylate, acrylonitrile and hydroxyethyl methacrylate. It is desirable to use dicarboxylic acid, such as itaconic acid, fumaric acid, and maleic acid with respect to the bond strength of an electrode. General approaches, such as adjustments of polymerization temperature, the amounts of polymerization initiators and chain transfer agents can be made (page 2, [016]). These groups of the monomers are readable as monomers (a) (b) and (c) in the instant claims.

With regard to the limitation of instant claim 12, Yoshino does not disclose the amount of the weight ratio of the polymers (a), (b) and (c).

It is noted that the amount of the weight ratio of the components (a), (b) and (c) is a result effective variable, and therefore, it is within the skill of those skilled in the art to find the optimum value of a result effective variable, as per *In re Boesch and Slaney* 205 USPQ 215 (CCPA 1980). See also *Peterson*, 315 F.3d at 1330, 65 USPQ2d at 1382: "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."

With regard to the limitation of instant claim 13, Yoshino discloses that the particle diameter does not have limit, but it is preferable the range 0.01-0.5 micron, and more preferable 0.01-0.3 micron, which is within the claimed range (page 2, [0017]).

With regard to the limitation of instant claim 14, Yoshino does not disclose the glass transition temperature of each polymers (a), (b) and (c).

Noritake discloses that the cell electrode binder core consists of a polymer with glass transition temperature in the range  $-100-0^{\circ}\text{C}$ , and shell consists of a polymer with glass transition temperature in the  $-5-50^{\circ}\text{C}$ , which is overlapping the claimed range (page 1, [0002]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the glass transition temperature of the core and shell polymers as taught by Noritake in Yoshino's polymer composition with reasonable expectation to success.

With regard to the limitation of instant claim 15, Yoshino discloses that the gel content should be 75-100%, which is within the claimed range (page 2, [0010]).

With regard to the limitation of instant claims 16-18, Yoshino discloses that spreading desiccation of the slurry is carried out on a base material as coating liquid, and the cell negative electrode is fabricated. If it requires at this time, it is possible to fabricate with a charge collector ingredient, and the charge collectors, such as aluminum foil and copper foil can also be used as a base material (page 3, [0024]).

As an example, it is shown, that when assembling a nonaqueous cell using the rechargeable battery negative electrode with  $\text{LiClO}_4$ ,  $\text{LiBF}_4$ ,  $\text{LiAsF}_6$ ,  $\text{CF}_3\text{SO}_3\text{Li}$ , etc. can be mentioned (page 3, [0027]).

Thus, the combination of Yoshino and Noritake renders all instant claims *prima facie* obvious in view of absent of unexpected results commensurate in scope of claims.

### **Conclusion**


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Bernshteyn whose telephone number is 571-272-2411. The examiner can normally be reached on M-F 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael Bernshteyn  
Patent Examiner  
Art Unit 1713

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06/07/2006

  
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